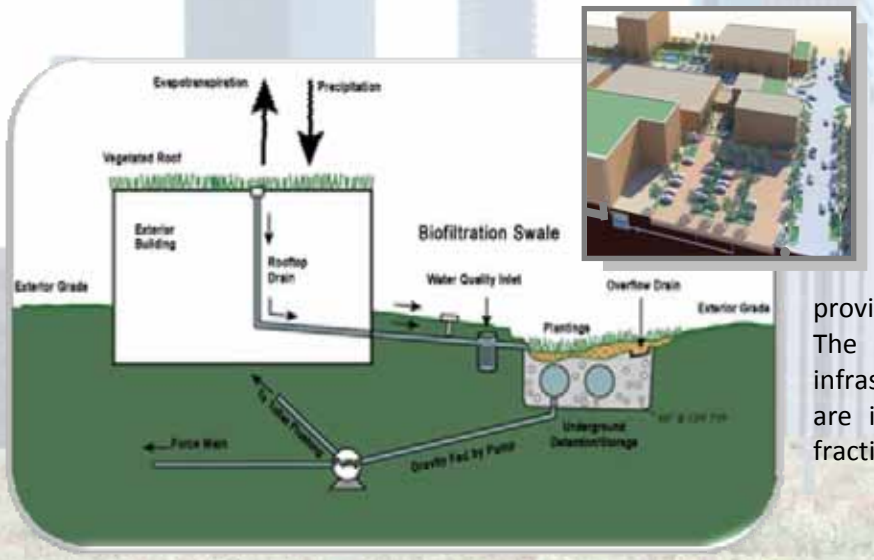
United States Environmental Protection Agency

RESEARCH PROJECT

National Risk Management Research Laboratory
Water Supply and Water Resources Division
Urban Watershed Management Branch

STATE-OF-THE-TECHNOLOGY ON ADVANCED DRAINAGE CONCEPTS



IMPACT STATEMENT

Fostering and promoting the implementation of innovative and green technology for new and retrofitting existing urban drainage systems will reduce installation and operation and management costs, energy needs, and provide for aesthetic enhancement of these systems. The anticipated overall life-cycle costs for infrastructure drainage over the next few decades are in the hundreds of billions of dollars and a fractional cost savings would amount to billions.

BACKGROUND:

This project is being conducted to satisfy the basic need for urban drainage infrastructure with consideration given to the most up-to-date technology. Much has been learned about drainage systems in the recent and historical past, and emphasis is being placed nationally and internationally on infrastructure improvement including green infrastructure, energy conservation and affordability. This project was implemented to establish a directional roadmap for the implementation of new and improvement of existing urban drainage systems.

DESCRIPTION:

The National Risk Management Research Laboratory, of EPA's Office of Research and Development, has funded this research project in support of its Aging Water Infrastructure (AWI) Research Program. The objective of the research project is to investigate and document a range of innovative technology and management strategies that are emerging outside the normal realm of business within the U.S that deal with urban watershed management control and failing infrastructure.

This project will conduct an international survey, including literature review and forums, of new and improved drainage concepts. The objective is to identify innovative strategies for managing the effects of wet-weather flow control and failing infrastructure in an urban setting. Investigations of wet-weather flow approaches through control and treatment at the source are important aspects of this project. The intent is to establish areas where external information can benefit EPA research and improve drainage (sewerage) systems. This includes gaining an understanding on developing priorities, research breakthroughs in other countries, and common needs across locations. Innovative systems that treat stormwater as a beneficial resource are being explored. This effort will focus on practices and technologies that can be implemented at the urban watershed management and infrastructure interface to combine cost-effective, integrated solutions. The result will be a document containing innovative urban watershed wet-weather flow management and control approaches from a national and international perspective.

The approach used in this work has been to: 1) complete a literature review (which among other things evaluated emerging technology with a focus on innovative combined sewerage system design and management) to establish a roadmap for advanced drainage implementation, and 2) conduct forums to enable focused review. Forums were held in Edinburgh, Scotland and Lyon, France in September and November 2008, respectively, with a total attendance of 89 international experts.

EPA GOAL: Goal #2 - *Clean & Safe Water*; Objective 2.1.1- *Water Safe to Drink*
ORD MULTI YEAR PLAN: Water Quality (WQ), Long Term Goal - WQ-3 *Source Control*

RESEARCH PARTNERS:
Collaborators: Graie, Lyon, France; Sheffield University-U.K.
Contractors: Tetra Tech., Inc; *Subcontractors:* ARC, LLC.

EXPECTED OUTCOMES AND IMPACTS:

It is expected that this project will result in increased acceptance of green infrastructure and practices that include: bioretention/biofiltration cells, porous pavement, rooftop storage, and beneficial use of stormwater; improved aesthetic values and reduced energy needs of drainage infrastructure; specific implementable topics and technologies; and lowered national costs for combined sewage overflow control and wet-weather drainage system installation, retrofitting, and operation and maintenance.

OUTPUTS:

Current and expected project outputs include:

- EPA (2009). *Innovative Approaches for Urban Watershed Wet-Weather Flow Management and Control: State of Technology Review Report* (EPA/600/R-09/128)
- Presentation/proceedings paper: Rowney, A.C.; Struck, S.D.; and Field, R. (August 2009). *Innovative Approaches for Urban Watershed Wet-Weather Flow Management and Control: Results of the International State-of-the-Technology Workshops*. 33rd International Association of Hydraulic Research Congress, Vancouver, BC.
- State of the technology Final Report - Expected completion date: December 2009

RESOURCES:

Aging Water Infrastructure Research Program: http://www.epa.gov/awi/

Urban Watershed Management Research: http://www.epa.gov/ednnrmrl/

EPA (2009). *Innovative Approaches for Urban Watershed Wet-Weather Flow Management and Control: State of Technology Review Report* (EPA/600/R-09/128): http://www.epa.gov/nrmrl/pubs/600r09128/600r09128.pdf

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